

REMARKS

Claims 1-6 and 10-17 are pending. By the foregoing Amendment, claim 16 has been amended, claim 14 has been canceled without prejudice or disclaimer toward pursuit of this subject matter in a divisional application, and new claims 18-24 have been added. Support for the amendments can be found at page 6, lines 1-2 and 9-11, page 7, lines 29-30, page 8, lines 16-17, and elsewhere in the specification.

Applicants thank the Examiner for courteously granting and professionally conducting an interview in this matter.

Claims 10-13, 16 and 17 have been rejected under 35 U.S.C. §103(a) as unpatentable over Herskowitz (U.S. Patent No. 5,652,193). This rejection is respectfully traversed.

Herskowitz teaches that the catalyst layer thickness should be minimized to decrease CH₄ selectivity. Unlike the invention recited in claim 10, Herskowitz does not teach or suggest a method in which a feed stream of H₂ and CO is passed through a catalyst structure having a pore size of at least about 0.1 μm. Herskowitz teaches a method that uses a catalyst pellet (col. 2, lines 1-3). Conventional catalyst pellets, such as those disclosed by Herskowitz, do not have a catalyst structure having a pore size of at least about 0.1 μm. The pore size of conventional catalyst pellets is much smaller. Herskowitz does not teach that CH₄ selectivity can be decreased by optimizing the pore size of supports.

The method recited in amended claim 16 is similar to the method of claim 10 and recites that the feed stream is passed through a foam, felt or wad.

The method of the present invention provides distinct advantages over conventional pellet catalysts. Among other advantages, applicants' method in which a feed stream passes through a

catalyst structure having a pore size of at least about 0.1 μm (or, alternatively, through a foam or a felt) enables molecular diffusion through the catalyst structure. In contrast, only Knudsen diffusion occurs within conventional catalyst pellets. With conventional catalyst pellets, molecular diffusion can only occur by flow around the pellets. The method of the present invention makes highly efficient use of reactor volume - because the feed stream can quickly flow through and react within the catalyst structure. The first pore size of a large pore material such as a foam, felt or wad allows rapid flow into and out of the catalyst structure, and the feed stream can react anywhere within the catalyst structure. This method of reacting a feed stream is clearly a significant advantage over the method of Herskowitz which requires either flow through a bed of very fine powders (and thus extremely large pressure drops) or flow around catalyst pellets containing only a rim of catalyst (the interior of Herskowitz' pellets do not contain catalyst). Moreover, molecular diffusion through the catalyst structure in the inventive method is fast, while in a conventional catalyst pellet only relatively slow Knudsen diffusion can occur. Thus, the method of the present invention enables higher yields, faster flow rates, or both, along with a lower pressure drop across the catalyst bed.

The claims are additionally allowable based on additional features recited therein.

For example, the method of claim 10 is additionally allowable over Herskowitz because Herskowitz does not teach or suggest an interfacial layer with a second pore size less than the first pore size.

Claim 11 is additionally allowable over Herskowitz because Herskowitz does not suggest a method in which reducing the pressure decreases selectivity toward methane. See Example 2 of applicants' specification. This is clearly an unexpected result.

Finally, as the Examiner is probably aware, applicants point out for the record that, to establish a prima facie case of obviousness, all recited limitations including the description of the catalyst structure through which flow occurs, must be suggested in the prior art. See MPEP 2143.03. In this case, the recited limitations discussed above have not been taught or suggested in the prior art.

Accordingly, withdrawal of the section 103 rejection is respectfully requested.

Restriction Requirement

Applicants submit that consideration and allowance of pending catalyst claims would not present an undue burden and, applicants request withdrawal of the restriction of the catalyst claims in favor of their consideration and allowance.

CONCLUSION

Applicants request withdrawal the pending rejection and allowance of this application. If the Examiner perceives any barriers to allowance or any matters related to this application that could be addressed by telephone, the Examiner is encouraged to call attorney for applicants at the number below.

Respectfully submitted,

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By: for

Date: Nov. 6, 2000

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